UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

NMFS Tracking No.: 2004/00482

October 12, 2004

Daniel M. Mathis
Federal Highway Administration
Suite 501 Evergreen Plaza
711 South Capitol Way
Olympia, Washington 98501-1284

Re: Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the Evans Bridge Replacement Project, Walla Walla County, Washington (HUC 170701020902, Dry Creek)

Dear Mr. Mathis:

Enclosed is a document containing a biological opinion (Opinion) prepared by NOAA's National Marine Fisheries Service (NOAA Fisheries) pursuant to section 7 of the Endangered Species Act (ESA) on the effects of the proposed Evans Bridge Replacement Project, Dry Creek, Walla Walla County, Washington. In this Opinion, NOAA Fisheries concludes that the proposed action is not likely to jeopardize the continued existence of ESA-listed Middle Columbia River steelhead (*Oncorhynchus mykiss*). As required by section 7 of the ESA, NOAA Fisheries includes reasonable and prudent measures with non-discretionary terms and conditions that NOAA Fisheries believes are necessary to minimize the impact of incidental take associated with this action.

This document contains a consultation on essential fish habitat (EFH) pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and its implementing regulations (50 CFR Part 600). NOAA Fisheries concludes that the proposed action may adversely affect designated EFH for chinook salmon. As required by section 305(b)(4)(A) of the MSA, included are conservation recommendations that NOAA Fisheries believes will avoid, minimize, mitigate, or otherwise offset adverse effects on EFH resulting from the proposed action. As described in the enclosed consultation, 305(b)(4)(B) of the MSA requires that a Federal action agency must provide a detailed response in writing within 30 days of receiving an EFH conservation recommendation.

If you have any questions, please contact Diane Driscoll of the Washington State Habitat Office at (509) 962-8911 x 227 or diane.driscoll@noaa.gov.

Sincerely,

Michael R Course

For D. Robert Lohn
Regional Administrator

cc: Michael Kulbacki

Endangered Species Act - Section 7 Consultation
Biological Opinion
and
Magnuson-Stevens Fishery Conservation and Management Act
Essential Fish Habitat Consultation

Evans Bridge Replacement
Middle Columbia River ESU
Dry Creek Subwatershed (170701020902)
Walla Walla River Watershed
Walla Walla County, Washington

Agency:	Federal Highway Administration
Consultation Conducted By:	National Marine Fisheries Service
Date Issued:	October 12, 2004
Issued by:	For Michael R Course D. Robert Lohn Regional Administrator
NMFS Tracking Number:	2004/00482

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INTRODUCTION

This document is the product of an Endangered Species Act (ESA) section 7 formal consultation and Magnuson-Stevens Fishery Conservation and Management Act (MSA) Essential Fish Habitat (EFH) consultation between NOAA's National Marine Fisheries Service (NOAA Fisheries) and the Federal Highway Administration (FHWA) for the funding of a proposed Evans Bridge Replacement, Walla Walla County, Washington. The project is found in the Dry Creek subwatershed, a tributary to the Walla Walla River. The action area is within the geographic range of the Middle Columbia River (MCR) steelhead (*Oncorhynchus mykiss*) Evolutionarily Significant Unit (ESU), listed as endangered under the ESA. In addition, the action area is designated as EFH for chinook (*O. tshawytscha*) salmon.

This document presents NOAA Fisheries' Biological Opinion (Opinion) on whether the proposed action is likely to jeopardize the continued existence of the MCR steelhead ESU. Further, this document indicates if the proposed action will adversely affect designated chinook salmon EFH. NOAA Fisheries makes these ESA and EFH determinations by analyzing the biological effects of construction related to the bridge replacement, relating those effects to the biological and ecological needs of the listed species or designated EFH, and then adding these effects to the environmental baseline of the action area.

Background and Consultation History

On April 23, 2004, NOAA Fisheries received a Biological Assessment (BA) and EFH assessment for the project described above, and a request for ESA section 7 formal consultation and MSA consultation. The FHWA concluded the proposed action is likely to adversely affect MCR steelhead but will have no adverse impact on EFH for chinook salmon.

To conduct its analysis, NOAA Fisheries used information provided in the BA and subsequent addenda, supporting documents, the EFH assessment, and correspondence received from the applicant by site visits, phone calls, post, and email. All correspondence is documented in the administrative record, found at the Washington State Habitat Office, Lacey, Washington.

Proposed Action

The FHWA proposes to fund, in whole or in part, a bridge replacement project by the Walla Walla County Department of Public Works (WWCPW). The WWCPW proposes to replace the Evans Bridge, on the Sapolil Road crossing of Dry Creek, a tributary to the Walla Walla River. A 120-foot long by 32-foot wide concrete bridge will replace the existing 40-foot long by 20-foot wide bridge in the same location. This is an in-kind replacement and will not change traffic patterns or traffic volumes. In addition, the FHWA will replace a culvert, roughly 150 feet north of the existing bridge, that drains a ditch onto the northeast side of the roadway. The existing culvert is too short for the new roadway and scour at the outlet is undermining the

roadway. The project will include rebuilding roughly 1,800 square yards of stream bank (1,500 square yards for the bridge and 300 square yards for the culvert replacement).

The proposed work includes:

1.2.1 Handling Fish and Worksite Isolation

The FHWA will conduct fish removal and worksite isolation in a manner that minimizes handling and stress to fish in the area (Appendix I). To prevent fish from moving into the work area, FHWA will install block nets at upstream and downstream locations. Block net mesh size, length, material, and depth will vary based on site conditions. Generally, block net mesh size is the same as the seine material (roughly one-fourth inch stretched). The FHWA will install the upstream net first. Biologists will then stretch a second net across the wetted channel and walk downstream, "herding" fish out of the work area. The FHWA will repeat this process several times to remove as many fish as possible without handling. If fish are still thought to be in the worksite after several attempts at "herding," qualified personnel will electroshock to capture and remove fish. To reduce or avoid the possibility of harm from electrofishing, the project proponent will adhere to NOAA Fisheries electrofishing guidelines (Appendix I; NMFS 2000) and use a qualified biologist to ensure the safe capture, handling, and release of fish. Personnel will immediately release any fish captured into nearby free-flowing water. During fish removal, the block nets will remain in place and designated personnel will check at least once daily to make sure the nets are functioning properly. The FHWA will check the nets for effectiveness and remove debris as necessary. A designated biologist will monitor and maintain the nets.

Construction of the Temporary Stream Bypass

After removing fish and isolating the work area, the FHWA, its funding recipient, or the recipient's contractor, will redirect flow from the river through a series of culverts totaling roughly 175 linear feet (900 square yards of channel) for the bridge replacement and 70 linear feet (60 square yards) for the culvert replacement. The culverts will be sized pass a minimum of 250% of the expected flow during the construction period. The contractor will install gravel bag revetments and concrete ecology blocks (or a similar temporary diversion) at the upstream end of the bypass inlet to divert the entire flow of the river into the culvert. They will install a similar revetment at the downstream end of the bypass to prevent backwatering the work area. During this phase of work, the contractor will also remove existing concrete pieces from the Dry Creek channel. After the diversion is in place, the contractor will fill the area between the upstream and downstream temporary revetments with gravel and cobble to form a work area and detour road. Placement of the temporary fill material will allow detoured traffic and machinery to move freely and safely over the dewatered area. The FHWA will ensure the fill material is removed following construction of the bridge substructure and removal of revetments. They will restore the channel at the bridge and culvert replacement areas before removing the diversion culverts and diversion revetments. After completing bank stabilization, the contractor will remove the bypass culverts, and diversion revetments from the stream channel.

Staging Areas, Temporary Construction Access and Detour Route

Clearing and grading of roughly one-third acre is necessary to construct the new bridge abutments, widen bridge approaches, and the bank reconstruction. Most of the area used for staging is graveled road shoulders or disturbed agricultural land.

The FHWA will use temporary work areas during installation of the new bridge; however, no temporary bridges or platforms will be built in the wetted river channel. Forming the work area will entail temporarily filling the dewatered section to make a level work area and temporary road crossing. Temporary diversion revetments set up upstream and downstream of the bridge will contain the fill. An existing field access road will serve as a staging area during construction. The FHWA will suspend any necessary raised work platforms from the new structure after removing the diversion.

While the river is diverted is in place, local traffic will drive over the dewatered area. Alternatives such as building temporary work platforms or bridges would result in significantly more disturbance to riparian habitats upstream and downstream of the existing bridge. Thus, dewatering of Dry Creek to allow removing the existing bridge will also simplify forming the new bridge abutments and reconstructing the riverbank without the need to affect the vegetated riparian area beyond the present road alignment.

Demolition of the Existing Bridge

Portions of the new bridge will overlap the footprint of the existing bridge, requiring removal of the existing bridge before construction. The FHWA will demolish the existing bridge after the river channel is dewatered.

The existing bridge is a concrete arch with the deck and abutments rigidly connected. The two existing abutments are below the ordinary high water mark (OHWM) of Dry Creek. Because of the nature of aged concrete, the brittle nature of the structure and limited amount of reinforcing steel, the FHWA expects the bridge to break into small and medium pieces that will fall into the dewatered area within the channel. Chain-link fence covered with geotextile fabric placed over the temporary culverts and fill will collect the debris; a track-type excavator or similar equipment will remove the material. The north upstream abutment footing is scouring and is sitting above the channel bottom, the south abutment footing is not exposed. Assuming both footings are at the same elevation, crews will not need to excavate below the existing streambed to remove either abutment. Work crews will remove the abutment footings using mechanical equipment. Placing coconut fiber-type matting to control erosion along the bank will require some minor excavation along the toe of the bank to key the material into the bank.

Construction of Stormwater Facilities

Currently, stormwater treatment for the existing roadway consists of overland flow into adjacent ditches for infiltration. Stormwater from the existing bridge flows direct into Dry Creek. Walla Walla County proposes to minimize effects of the existing and new impervious surface by building catch basins at each end of the new bridge. These catch basins will direct surface runoff to an open channel swale to promote infiltration and prevent direct access to Dry Creek. The roadside conveyance system for this project will provide 100% treatment of stormwater from the entire project area, both new and existing. This represents treatment of approximately 166% of the new impervious surface.

Construction of the New Bridge and Roadway Approach

Work on the replacement bridge will begin with building the bridge substructure. The new single-span bridge requires abutments on the north and south banks. Construction of the substructure will include:

- Recontouring stream banks (around the bridge) to a two-foot horizontal to one-foot vertical slope;
- The FHWA will use new steel 'H' piles to support the new concrete abutments.
- Poured-in-place concrete abutment walls will complete the bridge substructure.

The new bridge abutments will be at least 25 feet back from the top of the stream banks and above the OHWM. Since the stream flow will be within a culvert and the new bridge abutments will be outside the channel, no contact between the stream and uncured concrete, grout, or cement will occur.

Once the replacement substructure is in place, lifting equipment located on the banks above the OHWM will raise decked girders onto the substructure. The project will widen the road approaches from 20 feet to approximately 32 feet, to match the width of the new bridge. The approaches will taper to match the existing road at the limits of the roadway improvements. The longer bridge span and widened approaches will create an increase of roughly 1.5 acres of new impervious surface. The last phases of construction will involve installing beam guardrails on the approach roadway, and concrete Jersey barriers on the bridge.

Bank Reconstruction and Instream Habitat Enhancement

Removing the existing bridge, constructing new abutments, and replacing the drainage culvert will modify roughly 1,800 square yards of stream bank. Roughly1,500 square yards of bank reconstruction will occur because of the bridge and 300 square yards will occur because of the culvert replacement. Existing banks along Dry Creek in the action area are almost vertical. Bank reconstruction will include removing a car body buried in the banks within the bridge construction area and, constructing two-to-one slopes at both the bridge and culvert replacement location. At the bridge, a coir blanket will cover the new slope to protect the bank from erosion. Revegetating the stream banks at the bridge site will include seeding with native species, and

planting with willow slips and cottonwoods. The bank reshaping at the bridge site will not use any riprap. Reconstruction at the culvert site will include some heavy loose riprap as described below.

Culvert Replacement

A culvert currently exists about 150 feet north of the existing bridge and drains a ditch on the northeast side of the roadway. The FHWA will replace the existing culvert, which is too short for the new roadway, with a culvert of similar diameter (Figure 5). Scour has occurred at the outlet of the existing culvert, eating into the roadway and creating a hazard for vehicles. Guardrail placed along the shoulder will prevent vehicle access along the shoulder of the road and reduce the impact of the new roadway at the channel. The FHWA will place a filter blanket and heavy loose riprap at the outlet of the culvert with the face of the riprap matching into the existing channel bank contours. In addition, they will plant willow cuttings along the toe and within the riprap. During culvert replacement activities, the stream will be diverted through one or more temporary culverts sized to pass approximately 250% of the stream flow.

Construction will to take up to four months, from mid-July through mid-November. No work will occur below the OHWM before July 15 and after September 30. Some staging and preconstruction preparation outside the OHWM will occur before the July 15 start date. The FHWA will return the creek to its natural channel by September 30, the earliest date that adult MCR steelhead might begin migrating through the action area. After FHWA returns the stream flow to its natural channel, remaining work will include completing the new roadway approaches, installing new guardrails and Jersey barriers, and general site clean up.

Conservation Measures

Several measures will be carried out during the project to avoid or minimize potential direct impacts and minimize or compensate for indirect impacts. No interrelated or interdependent activities associated with the proposed action have been identified.

- To avoid potential direct impacts to MCR steelhead (as well as other aquatic species), in-water construction activities will be regulated by the work-window as specified in the HPA to be issued for the project. In-water work will occur only between July 15 and September 30. This will limit work within the wetted perimeter of the stream to the low-flow summer months when steelhead are not commonly present within the action area.

- To avoid direct and indirect effects resulting from staging areas, stockpiles, or equipment storage areas, all such facilities will be set back at least 50 feet from the top of the stream bank.
- To minimize the effect of dewatering the work area on steelhead and other fish, it is expected that the HPA for this project will require that the project proponent capture and safely remove game and food fish, including steelhead, resident trout, and other fish life

from the job site. Captured fish are required to be immediately and safely transferred to free-flowing water downstream of the bypass.

- The Washington Department of Fish and Wildlife (WDFW) will grant assistance and remove fish before construction if personnel are available. If WDFW personnel are not available, the FHWA will ensure fish are removed by a qualified fisheries biologist.

- Within seven days of completing the project, all disturbed areas will be stabilized to prevent erosion. All revegetation discussed above will be complete within one year.

- To minimize direct and indirect impacts associated with grading and soil disturbance, the contractor will implement a temporary erosion and sedimentation control plan (TESC) and site specific Best Management Practices (BMPs) as directed by the project engineer in accordance with Walla Walla County standard specifications for erosion control and standard HPA provisions. The contractor will be responsible for complying with these requirements by contractual obligation. Site specific Best Management Practices will include at a minimum:

    - Complying with Walla Walla County erosion control standards and HPA conditions.
    - Prohibiting washout from concrete trucks, vehicle maintenance, and refueling within 100 feet of the top-of-bank of the stream.
    - Outfitting construction equipment with emergency spill kits and training construction crews in their proper use.

Action Area

"Action area" means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02). For purposes of this consultation, the action area is Dry Creek from the upstream limits of construction (roughly 100 feet upstream of the existing bridge) to the downstream limit of construction (roughly 200 feet downstream of the bridge). The action area also includes the bordering riparian zone within the construction area and all areas affected by the project including any staging areas and roadways.

The 2004 Walla Walla Subbasin Plan indicates the action area is a migration corridor to upper elevation spawning habitat and provides juvenile rearing habitat for MCR steelhead. Although the action area is at the downstream end of the area where spawning habitat for threatened MCR steelhead is found, no suitable spawning substrate or redds are present in the project area so the likelihood of spawning in the action area is considered zero. However, the upper reaches of Dry Creek do provide good spawning habitat but adequate flows for adult migration will not be available until after September 30 when work below the OHWM is completed. Therefore, only MCR steelhead juveniles are considered likely to be present in the action area when work is done within the OHWM. In addition, the proposed project is within the area designated by the Pacific Fisheries Management Council as EFH for chinook salmon (PFMC (Pacific Fishery

Management Council) 1999), and the proposed project may adversely affect EFH for this species.

ENDANGERED SPECIES ACT

The ESA establishes a national program for conserving threatened and endangered species of fish, wildlife, plants, and the habitat on which they depend. Section 7(a)(2) of the ESA requires Federal agencies to consult with U.S. Fish and Wildlife Service and NOAA Fisheries, as appropriate, to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or adversely modify or destroy their critical habitats. Section 7(b)(4) requires the provision of an incidental take statement specifying the impact of any incidental taking and specifying reasonable and prudent measures to minimize such impacts.

Biological Opinion

This Opinion presents NOAA Fisheries' review of the status of each evolutionarily significant unit (ESU)[1] considered in this consultation and their critical habitat, the environmental baseline for the action area, all the effects of the action as proposed and cumulative effects. NOAA Fisheries analyzes those combined factors to conclude whether the proposed action is likely to appreciably reduce the likelihood of both the survival and recovery of the affected ESUs, or is likely to destroy or adversely modify critical habitat. See 50 CFR 402.14(g). If the action under consultation is likely to jeopardize an ESU, or destroy or adversely modify critical habitat, NOAA Fisheries must identify any reasonable and prudent alternatives for the action that avoid jeopardy or destruction or adverse modification of critical habitat and meet other regulatory requirements (50 CFR 402.02). Critical habitat is not currently designated for MCR steelhead, so that portion of the analysis will not be included in this document.

Status of the ESU

This section defines range-wide biological requirements of MCR ESU, and reviews the status of the ESUs relative to those requirements. The present risk faced by the ESU informs NOAA Fisheries' determination of whether additional risk will "appreciably reduce" the likelihood that an ESU will survive and recover in the wild. The greater the present risk, the more likely any additional risk resulting from the proposed action's effects on the population size, productivity (growth rate), distribution, or genetic diversity of the ESU will be an appreciable reduction (McElhany et al. 2000).

[1] 'ESU' means an anadromous salmon or steelhead population that is either listed or being considered for listing under the ESA, is substantially isolated reproductively from conspecific populations, and represents an important component of the evolutionary legacy of the species (Waples 1991). An ESU may include portions or combinations of populations more commonly defined as stocks within or across regions.

Long-term spawning surveys have not been conducted in the Walla Walla River, and as a result, reliable population estimates are unavailable (WDF et al. 1993). However, some flow and distribution data are available for Dry Creek (Mendel et al. 2003) indicating that *O. mykiss* can be found in the creek throughout the year. The WDF et al. (1993) report identified the Walla Walla stock as depressed and (Nehlsen et al. 1991) identified it as of special concern. The only naturally-occurring populations of anadromous fish present in the Walla Walla River subbasin are MCR steelhead. The MCR steelhead are still found throughout much of their historic range in the Walla Walla River subbasin including the North and South Forks and several of their tributaries, Mill Creek and several of its tributaries, Dry Creek, and the Touchet River basin (Kuttel 2001). There are no accurate estimates of historical MCR steelhead returns to the Walla Walla River subbasin.

Abundance

In the 2003 status review of MCR steelhead, the recent 5-year average (geometric mean) abundance for natural steelhead within this ESU was higher than levels reported in the last status review, with some exceptions (BRT 2003). Information on recent returns in comparison to return levels reported in previous status reviews is summarized in Table 1 (Touchet River is in the Walla Walla River subbasin and is representative of populations in the action area.)

Table 1. Recent population abundance estimates in relation to target population levels (BRT 2003)

ESU Spawning Aggregation*	Interim Abundance Target	Current vs. Target	Interim Productivity Objective
Touchet River	900	32%	Middle Columbia ESU populations are well below recovery levels. The geometric mean Natural Replacement Rate (NRR) will therefore need to be greater than 1.0
Klickitat River	3,600	Below target	
Yakima River	8,900	20%	
Fifteen mile Creek	900		
Deschutes River	5,400	95%	
John Day Upper Mainstem	2,000	102%	
John Day Lower Mainstem	3,200		
John Day Upper N. Fork	2,700		
John Day Lower N. Fork			
John Day Middle Fork	2,700		
John Day S. Fork	600		
Umatilla River	2,300	65%	

The Klickitat, Yakima, Touchet, and Umatilla systems are all well below their interim abundance targets (Table 1). The John Day and Deschutes are at or above their interim targets for abundance; however, there is significant concern about the straying of fish into the Deschutes system from other ESUs (Table 1). The productivity estimate of the MCR ESU is approximately 0.94 (95% CI: 0.69, 1.27) (McClure et al. 2003), indicating that the productivity of MCR steelhead is depressed. NOAA Fisheries' biological review team (BRT 2003) has determined the MCR ESU is likely to become endangered because of low abundance and depressed productivity.

Productivity

Short-term trends in major production areas were positive for seven of the 12 areas, with the Touchet River declining at 0.5% per year (BRT 2003). The median estimate of long-term trend over the 12 indicator data sets was -2.1% per year (-6.9 to +2.9), with 11 of the 12 being negative (BRT 2003). Spawner return data sets for Mid-Columbia production areas are of relatively short duration. Because of these considerations, projections based on simple population growth rate trends or on stock recruit relationships derived by fitting recent year spawner return data should be interpreted with caution. Existing data is insufficient to draw conclusions as to a clear trend in population growth.

Life history

Steelhead of the Walla Walla subbasin are typical of A-run inland steelhead. These are stream-maturing fish that spend an extended period in freshwater before spawning. Adult A-run fish enter the Columbia River from June to August and pass Bonneville Dam on their migration during the first of two peaks in the Columbia River steelhead run. The break point between these peaks is somewhat arbitrarily set at August 25, with A-run fish migrating past Bonneville before this date and B-run fish destined for the Clearwater and Salmon Rivers migrating after the 25th (Busby *et al.* 1996). After passing Bonneville Dam, steelhead destined for the Walla Walla subbasin continue their migration up the Columbia through the remainder of the summer and fall until reaching the mouth of the Walla Walla River. Steelhead start to enter the Walla Walla River with rising stream flows that typically occur in November and December. Steelhead spawning typically begins in early spring. Fry emerge from the gravel between May and mid-July. Steelhead young typically rear for two years in the subbasin before beginning outmigration with spring high flows. They will spend one to two years in the ocean before returning to spawn.

Environmental Baseline

The "environmental baseline" includes the past and present impacts of all Federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of state or private actions which are contemporaneous with the consultation in process (50 CFR 402.02).

NOAA Fisheries describes the environmental baseline in terms of the biological requirements for habitat features and processes necessary to support life stages of the subject ESUs within the action area. When the environmental baseline departs from those biological requirements, the adverse effects of a proposed action on the ESU or its habitat are more likely to jeopardize the listed species or result in destruction or adverse modification of critical habitat (National Marine Fisheries Service 1999).

The biological requirements of salmon and steelhead in the action area vary depending on the life history stage present and the natural range of variation present within the system (Groot and L. Margolis 1991; Spence et al. 1996; NRC (National Research Council) 1996). Generally, during spawning migrations, adult salmon require clean water with cool temperatures and access to thermal refugia, dissolved oxygen near 100% saturation, low turbidity, adequate flows, and depths to allow passage over barriers to reach spawning sites, and sufficient holding and resting sites. Anadromous fish select spawning areas based on species-specific requirements of flow, water quality, substrate size, and groundwater upwelling. Embryo survival and fry emergence depend on substrate conditions (e.g., gravel size, porosity, permeability, and oxygen concentrations), substrate stability during high flows, and, for most species, water temperatures of 57° F (13°C) or less. Habitat requirements for juvenile rearing include seasonally suitable microhabitats for holding, feeding, and resting. Migration of juveniles to rearing areas, whether the ocean, lakes, or other stream reaches, requires unobstructed access to these habitats. Physical, chemical, and thermal conditions may all impede migrations of adult or juvenile fish. The biological requirements likely to be affected by this action are water quality, food, and unimpeded access.

Each ESU considered in this Opinion resides in or migrates through the action area. Thus, for this action area, the biological requirements for salmon and steelhead are the habitat characteristics that would support MCR steelhead at all life stages, including sufficient food, adequate flowing water (quantity), high quality water (cool, free of pollutants, high dissolved oxygen concentrations, low sediment content), clean spawning substrate, and unimpeded migratory access to and from spawning and rearing areas (Spence et al.1996).

Agricultural land use dominates the Dry Creek subwatershed. Practices such as farming to the edge of streams, removing riparian vegetation, filling off-channel areas, allowing livestock full access to streams, conversion of native perennial vegetation to annual crops, and irrigation have all played roles in habitat degradation (Bureau of Reclamation 2001; U.S. Army Corps of Engineers 1997; Mendel et al. 2001; Saul et al. 2001). Low stream flows (exacerbated by surface water withdrawals), high water temperatures, heavily silted substrates, and many stream reaches altered by diking and/or channelization characterize Dry Creek, (Kuttel 2001). Dry Creek has experienced severe channel incision, with some highly unstable areas downcut 40 to 50 feet (Reckendorf 2001).

The major limiting factor throughout the Walla Walla subbasin, including Dry Creek, appears to be water diversions and withdrawals, which apparently are resulting in low stream flows and fish kills (Kuttel 2001). The WDFW estimates that less than 10% of surface water diversions in the Washington portion of the basin meet state or Federal juvenile fish screening criteria (Kuttel 2001). Bireley (2001) reported that more than 75% of the diversions identified in the Cooperative Compliance Review Program (CCRP) are in streams used for salmonid spawning, rearing, and migration. The high incidence of noncompliant surface water diversions is a serious threat to federally listed juvenile salmonids. Furthermore, it is likely that the diversions identified in the CCRP may represent only 50% to 60% of surface water diversions currently in

use in the Washington portion of the basin. At least 21 irrigation diversions on Dry Creek are known to be in use.

Stream habitats within the action area include a mix of glides and low gradient riffles. The only pool within the project area is a result of scour around one bridge footing. Available refugia and off-channel habitat is limited in the action area because of channel entrenchment and constriction. Woody vegetation in the action area is sparse and generally of a small diameter. Riparian vegetation consists of a narrow band of locust, willow, black cottonwood, serviceberry, and reed canarygrass.

Overall, the baseline conditions in the Walla Walla subbasin, including Dry Creek, are degraded. The stream channel within the action area is characterized by a lack of off-channel habitat, few wetlands, and streamflow regimes with high winter peaks and low summer flows (and associated high temperatures). Narrow, incised channels, flat gradients, and low flows create poor conditions for fish including isolated pools and stagnant flows. Off-channel habitats are nearly nonexistent along the reach because of severe channel incision (Kuttel 2001). Stream buffers are narrow, most woody vegetation is immature, and recruitment potential is poor. Decades of agricultural practices have heavily impacted the lower reaches of most major tributaries in this ESU. Tributaries and mainstem reaches in the upper portions of the Umatilla River, Walla Walla River, and the Klickitat River are all relatively intact and support both steelhead and resident *O. mykiss* populations although there are no specific estimates of abundance for the resident form (Kostow 2003 in BRT 2003).

Some sections of Dry Creek have been listed on the 303(d) list of the Clean Water Act because of DDT levels at the mouth, and fish habitat concerns at the mouth and just upstream of the action area (WDOE 2004). In addition, as of 1984, croplands in the Walla Walla subbasin delivered 252,000 tons/year of fine sediment to the stream channels. For comparison, forestlands delivered 354 tons per year (USDA SCS et al. 2001).

Effects of the Action on Listed Species and Their Habitat

"Effects of the action" means the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline (50 CFR 402.02). If the proposed action includes offsite measures to reduce net adverse impacts by improving habitat conditions and survival, NOAA Fisheries will evaluate the net combined effects of the proposed action and the offsite measures as interrelated actions.

"Direct effects" are the immediate effects of the project on the listed species or its habitat. "Indirect effects" are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur (50 CFR 402.02). Indirect effects may occur outside the area directly affected by the action, and may include other Federal actions that have not undergone section 7 consultation but will result from the action under consideration.

"Interrelated actions" are those that are part of a larger action and depend on the larger action for their justification; "interdependent actions" are those that have no independent utility apart from the action under consideration (50 CFR 402.02). Future Federal actions that are not a direct effect of the action under consideration, and not included in the environmental baseline or treated as indirect effects, are not considered in this Opinion.

Direct Effects

Worksite Isolation and Fish Handling. To reduce the likelihood of exposing fish to construction activities, the project includes a series of techniques to isolate them from the worksite. These include restrictions in timing of in-water construction, physically block netting the work area to exclude fish, capturing and moving residual fish observed in the blocked work area, and then electrofishing to locate and remove any remaining fish. The in-water work window of June 15 to September 30, before adult migration and spawning, and after downstream smolt migration, will minimize the likelihood of encountering listed fish to the maximum extent practicable. In addition, timing is such that all life stages are capable of moving away from the area (i.e., no redds in the area) to avoid the in-water work activities.

Isolating the work area and temporarily diverting the creek can strand juvenile steelhead. The handling of steelhead can increase plasma levels of cortisol and glucose (Hemre and Krogdahl 1996; Frisch and Anderson 2000). Further, when poorly done, electrofishing can injure or kill juvenile or adult steelhead. Physical injuries from electrofishing include internal hemorrhaging, spinal misalignment, or fractured vertebrae. In addition, diverting water through a culvert past the isolated work area could impede movement of steelhead.

To reduce or avoid the possibility of harm from electrofishing, the project proponent will adhere to the electrofishing guidelines in Appendix I and NMFS 2000, and use a qualified biologist to ensure the safe capture, handling, and release of fish. Finally, the bypass culvert will be sized and installed in a manner to ensure safe fish passage for any fish present during the in-water work period. Although these techniques are intended to reduce the number of fish that will experience construction effects, each of these activities can injure or kill fish. However, use of trained personnel and adherence to approved protocols (Appendix I and NMFS 2000) will minimize the likelihood of lethal effects to steelhead from electrofishing.

Therefore, although fish handling or electrofishing can injure or kill fish, NOAA Fisheries does not expect this action to injure or kill significant numbers of fish, based on the low number of fish expected to be in the area, the measures noted above, and the ability of fish to move away from the action area during the disturbance.

Water Quality. Streambank grading, removal of in-channel abutment footings, placement, and removal of dewatering barriers and the temporary bypass culvert can cause short-term increases in turbidity and sediment mobilization during and immediately after construction. The project incorporates measures to reduce, if not avoid, effects of sedimentation and turbidity, including restricting timing and duration of construction, temporary erosion and sediment control measures

and the use of a mixing zone. Construction methods will ensure that turbidity levels generated by the action do not exceed five nephelometric turbidity units (NTUs) above background levels beyond 100 feet (for flows between 1 and 10 cubic feet per second (cfs)) WDOE 2003. However, in the immediate vicinity of the construction activities (roughly 100 feet downstream) turbidity will likely exceed natural background levels for a short time, potentially affecting MCR steelhead.

Effects of suspended sediment, either as turbidity or suspended solids, on fish are well documented (summarized in Bash and others 2001). Suspended sediments can affect fish behavior and physiology and result in stress and reduced survival. Temperature acts synergistically to increase the effect of suspended sediment (Newcombe and Jensen 1996, Bash and others 2001). The severity of effect of suspended sediment increases as a function of the sediment concentration and exposure time, or dose (Newcombe and Jensen 1996, Bash and others 2001).

Deposition of fine sediment can significantly degrade instream spawning habitat, reduce survival of steelhead from egg to emergence (Phillips et al. 1975), reduce intergravel cover (Spence et al. 1996), and reduce the productivity of benthic organisms as food for fish. Suspended sediments can cause sublethal effects such as elevated blood sugars and cough rates (Servizi and Martens 1992), physiological stress, and reduced growth rates. Elevated turbidity levels can reduce the ability of salmonids to detect prey, cause gill damage (Sigler et al. 1984, Lloyd et al. 1987, Bash et al. 2001), and cause juvenile steelhead to leave rearing areas (Sigler et al. 1984). Additionally, studies indicate that short-term pulses of suspended sediment influence territorial, gill-flaring, and feeding behavior of salmon under laboratory conditions (Berg and Northcote 1985).

Mixing zones are geographically and temporally limited authorization (a few hours or a few days) for exceedance of water quality standards to be used during project construction. A mixing zone is allowed only after implementation of appropriate best management practices to avoid or minimize disturbance of sediment. Any deposition from suspended sediments within the action area will be flushed out, either when flow is reestablished or during the next high flow event (rain or snowmelt). Numerous studies have indicated that deposited sediment reduces benthic invertebrate abundance, but drift from upstream rapidly recolonizes the affected area (discussed further in following paragraphs) (Barton 1977; Chisolm and Downs 1978; Waters 1995). The temporary increase in turbidity will not be a significant addition to the environmental baseline over the long term.

Disturbance of Streambed. Demolishing the existing bridge, placing dewatering barriers, placing and removing temporary culverts, backfilling of the stream channel, and removing debris and backfill from the construction area will disturb the substrate of Dry Creek. Work within the stream channel is likely to mobilize existing sediment and displace benthic fauna in the immediate area (the impacts of increased turbidity and sediment deposition are discussed above). Additionally, the use of heavy equipment in the riparian areas and within the streambed can compact soils, reducing infiltration at the project site, decreasing the stability of the banks,

reducing recruitment of riparian vegetation, and increasing deposition of fine sediments into the river.

It is unlikely that the instream work will affect spawning habitat (no spawning habitat has been observed in the action area). Instream work can injure or kill fish by mobilizing existing sediment and homogenizing the substrate, thereby reducing the diversity of benthic habitat in the immediate area. Minshall (1984) has recognized and extensively researched the importance of the trophic relationship between benthos and fish productivity. Minshall (1984) observed that benthos abundance is lowest in homogeneous sand or silt or in large boulders and bedrock; abundance is greatest in the mixture of heterogeneous gravel pebble and cobbles.

The biological effects of episodic sediment inputs are usually temporary. Adherence to water quality standards as described above is expected to result in rapid recovery in the action area through invertebrate drift from upstream reaches. Based on the timing of the activity, temperature, and stream flow, invertebrate recolonization could occur within two weeks after completion of instream activity (Allan 1995; Waters 1995). Thus, the temporary loss of benthic prey for salmonids in the area will be insignificant. To minimize the disturbance of the streambed, the contractor will stay within the designated work area and access routes.

Upon completion of the bridge demolition and removal of the footings, FHWA will fill the excavated voids with clean washed gravels and contour the area to match the surrounding natural streambed elevations to ensure turbidity upon release of flow in the creek channel is minimized and meets the water quality criteria described above. Mechanical equipment for use in bridge removal will not be located in water, and heavy equipment will be limited to that with the least adverse effects on the environment. Therefore, removal of the old bridge footings and abutments, along with placement of rock clusters and gravels, should result in long-term improvements in streambed conditions within the action area.

Alteration of Streambanks and Riparian Vegetation. The FHWA will remove or temporarily alter existing riparian vegetation. Riparian vegetation links terrestrial and aquatic ecosystems, influences channel processes, contributes organic debris to streams, stabilizes streambanks, and modifies water temperatures (Gregory et al.1991). Woody debris provides essential functions in streams including the formation of habitats. Removal of vegetation can increase water temperatures, which would further degrade already impaired water temperatures in the action area. Elevated water temperatures may adversely affect salmonid physiology, growth, and development, alter life history patterns, induce disease, and may exacerbate competitive predator-prey interactions (Spence et al. 1996). Loss of vegetation also may reduce allochthonous inputs to the stream. Additionally, the removal of vegetation decreases streambank stability and resistance to erosion.

Because the FHWA will mow rather than remove, existing vegetation in areas of temporary fill, certain bank areas will maintain the root structure and promote rapid regeneration. Bank reconstruction will be necessary since the removal of the existing bridge will modify the streambanks. Bank reconstruction will create two-to-one slopes at both the bridge and the

culvert site to improve slope stability. A fabric composed of 100% coir twine (from coconut husks), seeded and planted with willow slips and cottonwood, will cover the slopes at the bridge location to stabilize soils and promote revegetation. Bank reconstruction at the bridge site does not require any riprap.

The FHWA will place a filter blanket and heavy loose riprap at the outlet of the culvert with the face of the riprap matching into the existing channel bank contours. In addition, they will plant willow cuttings along the toe and within the riprap. Soil and willow fascines placed within the riprap (providing in-kind replacement of riparian function within the first growing season). Together, these activities will minimize short-term adverse affects.

Indirect Effects

Indirect effects are caused by or result from the proposed action, are later in time and are reasonably certain to occur. Indirect effects may occur outside the action area directly affected by the action. Indirect effects might include other Federal actions that have not undergone section 7 consultation but will result from the action under consultation. These actions must be reasonably certain to occur, or a logical extension of the proposed action (50 CFR 402.02).

Over time, based on the design and features to be included, the project will result in incremental, beneficial effects to water quality by treating stormwater runoff. Improvements in fluvial transport, and channel morphology will also result from the larger structure spanning the river.

Impervious Surface and Stormwater Treatment. The project will add slightly less than one and one-half acres of new road and bridge surface in the Dry Creek subwatershed. There are several adverse effects associated with adding impervious surface. Runoff processes influence quantity, quality, and timing of surface and subsurface flow. Water routing influences riparian vegetation, nutrient inputs, and stream productivity. Runoff from paved surfaces can contain oil, grease, antifreeze, pesticides, and other pollutants harmful or lethal to aquatic organisms. If runoff from impervious surfaces flows directly into natural water systems, negative affects to steelhead include reducing invertebrate diversity and density, degrading water quality, water temperature, and/or altering the hydrology of stream habitat. Incorporating stormwater treatment facilities and other techniques into the project can reduce the adverse effects of those changes.

Under current conditions, the existing bridge drains directly into Dry Creek. The new bridge will route runoff from the bridge surface into catch basins located at the ends of the new bridge. These catch basins will direct water to an open channel swale that will prevent untreated runoff from entering Dry Creek. Water from the new road surfaces will sheet-flow into the roadside swale. The roadside open conveyance system for this project will treat 100% of the estimated stormwater from the entire roadway. Treatment of runoff through infiltration sites will minimize disruption of the hydrology of the system, and minimize or reduce the extent pollutants and fine sediments that presently flow directly into the river.

Changes in Fluvial Transport, Channel Morphology and Complexity. The current condition of the lower Dry Creek provides little refugia for adults or juveniles. The existing conditions in the area of the bridge constrict the channel, contribute to channelization, restrict floodplain access, and provide little riparian structure or function. The replacement of the existing bridge with a longer, single-span structure, complete removal of the in-water abutments, and reshaping and revegetating the streambanks will slightly improve the transport of sediment, and improve riparian structure and function.

Although the new bridge will not specifically cause streambed aggradation or reconnection to the floodplain, it will remove the negative effects of the old piers. Overall, the project will result in minor improvements in fluvial transport, and channel morphology in the action area.

Cumulative Effects

"Cumulative effects" are those effects of future state or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation (50 CFR 402.02). Cumulative effects that reduce the capacity of listed ESUs to meet their biological requirements in the action area increase the risk to the ESU that the effects of the proposed action on the ESU or its habitat will result in jeopardy (NMFS 1999).

Agricultural activities are the main land use, in the action area and within the Walla Walla subbasin as a whole. Land-use activities are not expected to substantially change. These activities include land disturbance and water diversion that increase sediment runoff, and degrade water quality through a reduction in in-stream flow. This often leads to increased water temperature, and a decrease in dissolved oxygen, which can negatively affect MCR steelhead growth and survival. Efforts have begun to improve conditions for steelhead in the Walla Walla subbasin. The WDFW is involved in upgrading hundreds of irrigation screens and systems that currently block or entrain steelhead, and FHWA has been replacing outdated stream crossing structures with new designs that reduce or eliminate interference with channel morphology. This project is the fourth bridge replacement on Dry Creek since 2002. The work undertaken by the WDFW, FHWA and others will have little beneficial effect without corresponding efforts to remove fish passage barriers, increase instream flows, improve riparian buffers and reduce sediment runoff in the action area. The long-term beneficial effects of this specific project will likely be immeasurable. However, coordinated efforts throughout the watershed, including removal of stream constricting bridge structures will contribute to overall, incremental improvement in water quality and channel morphology for the lower watershed.

Between 1990 and 2000, the population of Walla Walla County increased by 2.8%. NOAA Fisheries assumes that future private and state actions will continue within the action area, increasing as population density rises. As the human population in the action area continues to grow, demand for agricultural, commercial, or residential development is also likely to grow. The effects of new development caused by that demand are likely to further reduce the conservation value of habitat within the action area.

Although quantifying an incremental change in survival for the ESUs considered in this consultation due to the cumulative effects is not possible, it is reasonably likely that those effects within the action area will have a long-term negative effect on the likelihood of survival and recovery of MCR steelhead.

Conclusion

After reviewing the best available scientific and commercial information regarding the biological requirements and the status of the MCR steelhead ESU considered in this Opinion, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, NOAA Fisheries' concludes that the action, as proposed, is not likely to jeopardize the continued existence of these species.

These conclusions are based on the following considerations: (1) All in-water work will be completed between June 15 and September 30 when streamflow in Dry Creek is low and adult steelhead and redds will not be present; (2) The direct effects to MCR steelhead from work area isolation and removal of listed fish will be short-term. Stream bypass location and design, fish handling protocol, conservation measures, and BMPs will minimize these effects; (3) The direct effects on water quality (sediment and turbidity, and potentially chemical contamination) from project construction will be short-term. Conservation measures and BMPs will minimize these effects; (4) The direct effects to streambed substrate and streambank condition from excavation for the footing removal, culvert replacement and associated riparian vegetation removal will be short-term. Elements of the replacement culvert design, conservation measures, and BMPs will minimize these effects; (5) There will be long-term improvements in water quality and flow/hydrology from implementation of stormwater quantity and quality project elements and conservation measures; (6) The long-term indirect effects from reduced channel confinement with removal of the existing channel constriction, is to allow some channel forming processes to take place; (7) The negative effects from the removal of riparian vegetation are temporary with long-term improvement in riparian reserves from riparian vegetation enhancement; and (8) The proposed action is not likely to impair properly functioning habitat, or retard the long-term progress of impaired habitat toward a functional condition essential to the long-term survival and recovery of UCR steelhead at the population or ESU scale.

Conservation Recommendations

Section 7 (a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. The following recommendations are discretionary measures that NOAA Fisheries believes are consistent with this obligation and therefore should be carried out by the FHWA:

1. Increase the amount of riparian planting in the upstream and downstream vicinity of the project to promote bank stability and encourage additional lateral habitat heterogeneity.

2. Place LWD along the banks of Dry Creek to provide additional rearing habitat and possibly increase densities of juvenile MCR steelhead.

3. Build fences and provide off-site watering opportunities to exclude livestock from fragile streambanks along Dry Creek.

Please notify NOAA Fisheries if the FHWA carries out these recommendations so that we will be kept informed of actions that minimize or avoid adverse effects, and those that benefit species or their habitats.

Reinitiation of Consultation

Reinitiation of formal consultation is required and will be requested by the Federal agency or by the Service, where discretionary Federal involvement or control over the action has been retained or is authorized by law and: (a) if the amount or extent of taking specified in the incidental take statement is exceeded; (b) if new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (c) if the identified action is subsequently modified in a manner that has an effect to the listed species or critical habitat that was not considered in the biological opinion; or (d) if a new species is listed or critical habitat designated that may be affected by the identified action (50 CFR 402.16).

To reinitiate consultation, contact the Washington State Habitat Office of NOAA Fisheries, and refer to the NOAA Fisheries Number assigned to this consultation (2004/00482).

Incidental Take Statement

The ESA at section 9 prohibits the taking of listed species without a specific permit or exemption. Protective regulations adopted pursuant to section 4(d) extends the prohibition to threatened species. Among other things, an action that harasses, wounds, or kills an individual of a listed species or harms a species by altering habitat in a way that significantly impairs its essential behavioral patterns is a taking (50 CFR 222.102). Incidental take refers to takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant (50 CFR 402.02). Section 7(o)(2) exempts any taking that meets the terms and conditions of a written incidental take statement from the taking prohibition.

Amount or Extent of Anticipated Take

Individuals of the ESU considered in this consultation are likely to be present in the action area during part of the year when at least some effects of the proposed action will occur. Because these effects will injure or kill, or increase the likelihood that individuals will be injured or killed, take is reasonably certain to occur. NOAA Fisheries can sometimes estimate the number of fish injured or killed by worksite isolation techniques. Below, NOAA provides a numeric amount of take for fish that will be taken during these practices. However, the distribution and abundance of individual fish in the action area is too imprecise to enable an estimate of specific numbers of fish injured or killed by habitat modifying activities. In such circumstances, NOAA Fisheries uses the causal link established between the activity and a change in habitat conditions affecting the species to describe the anticipated extent of take as a quantity of predicted habitat disturbance.

The extent of incidental take NOAA Fisheries anticipates for habitat-modifying activities from the proposed action is that number of fish that would experience degraded water temperature, and food availability from the temporary modification of 300 linear feet of Dry Creek at the Sapolil Road crossing. The 300 linear foot extent of habitat modification includes roughly 100 feet upstream to 175 feet downstream of the bridge. Habitat modification within this reach includes the replacement culvert, habitat disturbance from the temporary bypass culverts, instream fill, removal of old footings, bank reconstruction, culvert excavation and replacement, culvert riprap placement, and revegetation of all disturbed sites. NOAA Fisheries anticipates take from temporary turbidity increases within a reach 50 feet upstream of the project area to 100 feet downstream of the project area, for flows up to 10 cfs.

NOAA Fisheries anticipates take from electrofishing techniques to be two fish (NMFS 2002a, 2002b). An estimate of the number of listed fish expected to be encountered during worksite isolation was obtained using the results of similar fish removal activities in the Lower Walla Walla River subbasin (Dry Creek and the Walla Walla River) in August 2002 (NMFS 2002a, 2002b).

Table 1. Estimate of nonlethal and lethal take associated with proposed project requiring isolation of an in-water work area and electrofishing to collect and remove fish.

Species	Life stage	Estimated Total catch	Estimated Nonlethal Take of ESA listed fish	Estimated Lethal Take of ESA listed fish
MCR steelhead	juvenile	20	18	2

NOAA Fisheries will update this estimate of incidental take before March 31 each year after reviewing in-water construction monitoring reports from the preceding year describing isolation of in-water work area operations. Because of the timing of the in-water work period, capture and release of adult fish is not expected to occur as part of the proposed isolation of in-water work areas. Thus, NOAA Fisheries does not anticipate take of any adult fish. If any of the limits

outlined above are exceeded, construction must stop and the action agency must reinitiate consultation.

The estimated number of listed fish taken via work area isolation and removal of fish, and the extent of habitat affected from the construction activities (e.g., sediment mobilization, and short-term degradation to the streambed and riparian habitat) are the thresholds for reinitiating consultation. Should any of these limits be exceeded during project activities, the reinitiation provisions of this Opinion apply.

Reasonable and Prudent Measures

Reasonable and prudent measures are non-discretionary measures to avoid or minimize take that must be carried out by cooperators for the exemption in section 7(o)(2) to apply. The FHWA has the continuing duty to regulate the activities covered in this incidental take statement where discretionary Federal involvement or control over the action has been retained or is authorized by law. The protective coverage of section 7(o)(2) may lapse if the FHWA fails to exercise its discretion to require adherence to terms and conditions of the incidental take statement, or to exercise that discretion as necessary to retain the oversight to ensure compliance with these terms and conditions. Similarly, if any applicant fails to act in accordance with the terms and conditions of the incidental take statement, protective coverage may lapse. The following reasonable and prudent measures are necessary and appropriate to minimize the impact on listed species of incidental taking caused by the proposed action.

1. The FHWA will ensure minimization of incidental take from project construction activities within the OHWM.

2. The FHWA will ensure minimization of incidental take from construction activities within riparian, and adjacent upland areas.

3. The FHWA will ensure that the limits of take in the incidental take statement are not exceeded by completion of a monitoring and reporting program (50 CFR 402.14(i)(1)(iv) and (I)(3)).

Terms and Conditions

To be exempt from the prohibitions of section 9 of the ESA, the FHWA and its cooperators, including the applicant, if any, must comply with the following terms and conditions that implement the reasonable and prudent measures described above. Partial compliance with these terms and conditions may invalidate this take exemption, result in more take than anticipated, and lead NOAA Fisheries to a different conclusion regarding whether the proposed action will result in jeopardy or the destruction or adverse modification of critical habitats.

1. To implement RPM No.1 (construction activities within the OHWM), the FHWA will ensure that:

a. Construction methods will not cause turbidity to extend beyond 100 feet downstream of the project area (as described in WAC-201-100 and WAC-201-110). The use of a mixing zone is intended for brief periods of time (a few hours or a few days) and is not intended as authorization to exceed turbidity standards for the duration of the project. Additionally, a mixing zone is only allowed after the implementation of appropriate best management practices to avoid or minimize disturbance of sediment.

2. To implement RPM No. 2 (streambed, riparian, and upland construction activities), the FHWA will ensure that:

a. The Temporary Erosion and Sediment Control (TESC) plan to eliminate or minimize, to the maximum extent practicable, the movement of soils and sediments both into the creek from all upland construction areas and within the creek will be included as provisions in the contract and will be implemented.

b. Boundaries of clearing limits associated with site access and construction will be marked to minimize disturbance of riparian vegetation, wetlands and other sensitive sites.

c. Existing roadways or travel paths will be used whenever possible.

d. Heavy equipment will be limited to that with the least adverse effects on the environment (*e.g.*, minimally sized, rubber tired).

e. Vehicles and equipment will only cross the streambed and riparian areas within the upstream and downstream limits of construction. This includes the bridge location.

f. Hydraulic fluid in heavy equipment that will operate over the water or below the OHWM will be replaced with mineral oil or other biodegradable, non-toxic hydraulic fluid.

g. Vehicle and equipment cleaning, maintenance, refueling, and fuel storage will take place a minimum of 100 feet from the top of any streambank or wetland.

h. Stationary power equipment operated within 100 feet of the top of any streambank or wetland will be diapered to prevent leaks.

i. Adequate treatment will be provided for all wash and rinse water prior to upland infiltration.

3. To implement RPM No. 3 (instream and riparian habitat protection), the FHWA will ensure that:

   a. Rock used for construction will be clean, angular rock, of the minimum possible size. Rock will be "placed" not dumped, and will be installed to withstand the 100-year peak flow.

   b. Alteration of native vegetation will be minimized. Where native vegetation is altered, measures will be taken to ensure that roots are left intact, reducing erosion while still allowing workspace.

   c. Any topsoil removed will be stockpiled for redistribution in the project area.

   d. Disturbed riparian areas replanted with native woody species will have a minimum planting density of 3 feet on-center for cuttings and 6 feet on-center for rooted trees and shrubs.

   e. Fencing will be installed to allow new plantings to establish and prevent trampling by livestock or humans.

   f. Surface application of nitrogen fertilizer will not take place within 50 feet of any water in the action area.

   g. Invasive exotic plant species (*e.g.*, Himalayan blackberry) will be controlled within the project area. However, NOAA Fisheries does not exempt any take that may result from the use of herbicides, chemical treatments will not be used in their control.

4. To implement RPM No. 4 (effectiveness monitoring and reporting), the FHWA will ensure that:

   a. All salmonids encountered during work area isolation and fish-movement operations will be documented by In-water Construction Monitoring Report forms (Appendix II), or equivalent. The FHWA will submit monitoring reports to NOAA Fisheries no later than December 31 of construction year.

   b. Erosion control T&Cs, including conservation measures and BMPs, will be monitored and corrective action taken if necessary to ensure protection of riparian areas and waterways.

   c. Riparian plantings will be monitored yearly for three years to ensure a minimum of 80% cumulative survival. Mortalities will be replaced to bring the site into conformance. If failed plantings are deemed unlikely to succeed, replacement

plantings will be conducted at other appropriate locations in the project area. A report on the results of the riparian monitoring program will be submitted to NOAA Fisheries at the end of each calendar year during the three year monitoring period.

d. All reports will be sent to National Marine Fisheries Service, Washington State Habitat Office, Attention Diane Driscoll, 510 Desmond Drive SE, Suite 103, Lacey, Washington 98503.

NOTICE. If a sick, injured or dead specimen of a threatened or endangered species is found, the finder must notify the Vancouver Field Office of NOAA Fisheries Law Enforcement at (360) 418-4246. The finder must take care in handling of sick or injured specimens to ensure effective treatment, and in handling dead specimens to preserve biological material in the best possible condition for later analysis of cause of death. The finder also has the responsibility to carry out instructions provided by Law Enforcement to ensure that evidence intrinsic to the specimen is not disturbed unnecessarily.

MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

Background

The MSA, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance EFH for those species regulated under a Federal fisheries management plan. Pursuant to the MSA:

- Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (section 305(b)(2));

- NOAA Fisheries must provide conservation recommendations for any Federal or state activity that may adversely affect EFH (section 305(b)(4)(A));

- Federal agencies must provide a detailed response in writing to NOAA Fisheries within 30 days after receiving EFH conservation recommendations. The response must include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the effect of the activity on EFH. In the case of a response that is inconsistent with the conservation recommendations of NOAA Fisheries, the Federal agency must explain its reasons for not following the recommendations (section 305(b)(4)(B)).

Essential Fish Habitat means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA section 3). For the purpose of interpreting this definition of EFH: Waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50 CFR 600.110). Adverse effect means any impact which reduces quality and/or quantity of EFH, and may include direct (*e.g.*, contamination or physical disruption), indirect (*e.g.*, loss of prey or reduction in species fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810).

An EFH consultation with NOAA Fisheries is required regarding any Federal agency action that may adversely affect EFH, including actions that occur outside EFH, such as certain upstream and upslope activities.

The objectives of this EFH consultation are to determine whether the proposed action may adversely affect designated EFH and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects to EFH.

Identification of Essential Fish Habitat

Pursuant to the MSA, the Pacific Fisheries Management Council (PFMC 1999) has designated EFH for three species of federally-managed Pacific salmon: chinook, coho, and Puget Sound pink salmon (PFMC 1999). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC), and longstanding, naturally-impassable barriers (i.e., natural waterfalls in existence for several hundred years). Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14 to the Pacific Coast Salmon Plan (PFMC 1999). Assessment of the impacts to these species' EFH from the proposed action is based on these descriptions and information provided by the FHWA.

Proposed Action

The proposed action and action area are detailed in sections 1.2 and 1.3 of this document. The action area includes habitats that have been designated as EFH for various life-history stages of chinook salmon.

Effects of the Proposed Action

As described in sections 2.2 and 2.3 of this document and in the EFH analysis provided by the WSDOT, the proposed action may result in detrimental short- and long-term impacts to a variety of habitat parameters. These adverse effects are:

a) Short-term degradation of benthic foraging habitat because of the temporary diversion of approximately 250 linear feet of the Dry Creek stream channel.

b) Short-term degradation of water quality in the action area because of an increase in turbidity during in-water construction and the potential for contaminants to reach the stream.

c) Short-term degradation of habitat because of temporary loss of approximately 300 linear feet of streambank vegetation.

Conclusion

NOAA Fisheries believes that the proposed actions may adversely affect EFH for chinook salmon.

Essential Fish Habitat Conservation Recommendations

Pursuant to section 305(b)(4)(A) of the MSA, NOAA Fisheries is required to provide EFH conservation recommendations to Federal agencies regarding actions that would adversely affect EFH. While NOAA Fisheries understands that the conservation measures described in the BA will be implemented by the FHWA, it does not believe that these measures are sufficient to address the adverse impacts to EFH described above. Consequently, NOAA Fisheries recommends that the FHWA implement the following conservation measures to minimize the potential adverse effects to EFH for chinook salmon:

1. To minimize degradation of benthic foraging habitat, all work within the active channel should be completed between July 15 and September 30. On or before September 30, the temporary culvert and fill will be removed and flow will be restored to the natural channel.

2. To minimize adverse affects to water quality, FHWA will ensure that:

3. All temporary sediment control (TESC) and pollution control measures included in the BA are included as provisions in the contract. The contractor should have a Spill Prevention Control and Containment Plan (SPCC) and a TESC Plan reviewed by the WDFW and FHWA and in place prior to the start of any construction activities.

4. Turbidity plumes should not extend greater than 100 feet downstream of the project area (for flows above 1 cfs and less than 10 cfs). If flows exceed 10 cfs, turbidity cannot extend beyond 200 feet downstream of the project area as described in WAC 173-201A-200 (WDOE 1997).

5. To minimize the temporary loss of riparian habitat, FHWA should:

6. Ensure that streambank alteration does not extend beyond 300 linear feet.

7. Minimize alteration of native vegetation and where possible, mow to keep root systems intact, increasing bank stability and speed of regeneration.

8. Replant disturbed areas with a mix of native seeds, shrubs and trees.

Supplemental Consultation

The FHWA must reinitiate EFH consultation with NOAA Fisheries if the proposed action is substantially revised in a manner that may adversely affect EFH, or if new information becomes available that affects the basis for NOAA Fisheries' EFH conservation recommendations (50 CFR 600.920(l)).

REFERENCES

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APPENDIX I - Fish Removal Protocol

Isolation of the work area, fish removal and release of fish will be conducted or directed by a biologist who possesses the competence to ensure the safe handling of all Endangered Species Act (ESA) listed fish, and who is also experienced with work area isolation.

1. Isolation of the Work Area: Installation of block nets will occur at predetermined locations, based on site characteristics, to prevent fish and other aquatic wildlife from moving into the area. When selecting a suitable site, look for an area that has desirable attributes such as slower flows, suitable locations for stake and/or sandbag placement. Whenever conditions allow, the downstream block net will be placed first. The upstream block net will then be used as a seine to herd fish from the downstream block net location upstream to the point selected for the upstream block net installation. If feasible, this action will potentially move significant numbers of fish upstream, out of the impact area prior to other removal methods. If herding fish upstream is prohibitive because of flow velocities, install the upstream block net first, then the herd fish downstream and install the downstream block net. Both approaches have the added benefit of relocating fish without physically handling them.

   Block net mesh size, length, type of material, and depth will vary based on site conditions. The directing biologist on site will base the design of block nets on specific site characteristics such as water depth, velocity and channel width. Typical block net material is 9.5 millimeter stretched mesh. Block nets will remain in place until inwater work is completed. Block nets will require leaf and debris removal. An individual should be assigned the responsibility of frequently checking the nets to maintain their effectiveness and integrity. The frequency of such checks will be determined on a case-by-case basis, dependent upon the system, season and weather conditions. An individual will be stationed at the downstream block net continuously during electrofishing sessions, to recover stunned fish in the event they are washed downstream and pinned against the net. Block nets need to be secured along both banks and in-channel to prevent failure during unforeseen rain events or debris accumulation. Some locations may require additional block net support (examples include galvanized hardware cloth and metal fence posts).

2. Fish Removal: The following methods provide alternatives for removal of fish from the area between the block nets. These methods are given in order of preference and for many locations, a combination of methods will need to be applied. The use of visual observation techniques should be considered for evaluation of removal method effectiveness and to identify specific locations of fish concentrations prior to removal attempts. Use of a seine net will be the preferred method. The remaining methods will be used when seining is not possible or to enhance the effectiveness of seining.

- Seines made from 9.5 mm stretched nylon mesh will be used to remove fish from the isolated stream reach. Seine design will be dependent upon site-specific characteristics. The on-site biologist will plan seining procedures based on an evaluation of site characteristics.

- On projects where dewatering will occur aquatic life will be collected by hand or with dip nets as the site is slowly dewatered.

- Capture of fish by personnel in water or on shore using hand held nets when in water work will occur without dewatering (typically used in conjunction with seining).

- Baited minnow traps (typically used in conjunction with seining).

- Electrofishing will be performed only when other methods have been determined to be unfeasible or ineffective by the directing biologist. Electrofishing equipment uses voltage and currents that can cause serious injury to fish removal personnel. Electrofishing studies document injury rates to fish even at low settings. Therefore, use of this method is discouraged when unnecessary. The potential for injury to fish removal personnel or ESA-listed fish may outweigh the benefit of capture and relocation of all fish present in the work area. The injury potential of electrofishing on fish has been related to fish size in research literature. Therefore, the following guidelines are for juvenile ESA-listed fish and **exclude adult ESA-listed fish.** The following conditions will apply to use of electrofishing as a means of fish removal:

    1. Electrofishing will only be conducted when a biologist with 100 hours of electrofishing experience is on site to conduct or direct all activities associated with capture attempts. The directing biologist will be familiar with the principles of electrofishing including the interrelated effects of voltage, pulse width and pulse rate on fish species and associated risk of injury/mortality. The directing biologist will have knowledge regarding galvanotaxis, narcosis and tetany, their respective relationships to injury/mortality rates, and have the ability to recognize these responses when exhibited by fish.

    2. The following chart will be used as guidelines for electrofishing in water likely to support ESA-listed juvenile fish. Visual observation of the size classes of fish in the work area is helpful to avoid injury to larger fish by the mistaken assumption that they are not present.

	Initial Setting	Conductivity (μS/cm)	Maximum Settings
Voltage	100 V	less than 100	1100 V
		100-300	800 V
		greater than 300	400 V
Pulse Width	500 μs		5 ms
Pulse Rate	15 Hz		60 Hz

3. Seasonal timing restrictions for conducting electrofishing will be dependent upon the river system, fish composition and an analysis of the life history of documented species. Spawning adults and redds with incubating eggs should not be subjected to the effects of electrofishing. As a general rule, anadromous waters should not be electrofished from October 15 to May 15 and resident waters from November 1 to May 15. It will be the responsibility of the directing biologist to research and assess the time of year (for each river system) when electrofishing is appropriate.

4. Each session will begin with low settings for pulse width and pulse rate. If fish present in the area being electrofished do not exhibit an appropriate response the settings should be gradually increased until the appropriate response is achieved (galvanotaxis). Conducting electrofishing activity at the minimal effective settings is imperative because as pulse width and pulse rate increase fish injury rates increase. Minimum effective voltage settings are dependent upon water conductivity and will need to increase as conductivity decreases. Higher voltages elevate the risk of serious injury to fish removal personnel. Use the lowest effective setting to minimize personnel safety concerns and help minimize fish injury/mortality rates.

5. The operator will not allow fish to come into contact with the anode. The zone of potential fish injury is 0.5 m from the anode. Extra care will be taken near inwater structures, undercut banks, in willow waters, or high-density fish areas. Voltage gradients may be abnormally intensified in these areas and fish are more likely to come into close contact with the anode. Consider lowering the voltage setting in willow water sections. When electrofishing areas near undercut banks or where structures may provide cover for fish use the anode to draw the fish out by placing the activated anode near the area fish are likely present and slowly draw the anode away. Fish experiencing galvanotaxis will be attracted to the anode and will swim away from the structure toward the anode so that they can be netted. This will not work on fish that experience narcosis or tetany. Therefore, fish response should be noted in adjacent areas prior to attempts made near structures to avoid prolonged exposure of fish to the electrical field that are in an immobilized state.

6. Electrofishing will be performed in a manner that minimizes harm to fish. Once an appropriate fish response (galvanotaxis) is noted, the stream segment will be worked systematically, moving the anode continuously in a herringbone pattern through the water. Do not electrofish one area for an extended period of time. The number of passes will be kept to a minimum. Adequate numbers of personnel will be on-site to minimize the number of passes required for fish removal. Adequate staff to net, recover and release fish in a prompt manner will be present. Fish will be removed from the electrical field immediately and recovered when necessary. Fish will not be held in net while continuing to capture additional fish.

7. Carefully observe and document the condition of the captured fish. Dark bands on the body and extended recovery times are signs of injury or handling stress. When such signs are noted, the settings for the electrofishing unit and/or manner in which the electrofishing session is proceeding need adjustment. These characteristics may be an indication that electrofishing has become an inappropriate removal method for that specific site. Specimens will be released immediately upstream of the block nets in an area that provides refuge. Each fish will be completely recovered prior to release (see Fish Release section).

8. Electrofishing will not occur when turbidity reduces visibility to less than 0.5 meters and will not occur when water temperature is above 18°C or below 4°C.

- Pumps used to temporarily bypass water around work sites will be fitted with mesh screens to prevent aquatic life from entering the intake hose of the pump. The screen will be installed as a precautionary measure to protect any fish and other wildlife, which may have been missed in the isolation and fish removal process. The screens will also prevent aquatic life from entering the intake hose if a block net should fail. Screens will be placed approximately 2-4 feet from the end of the intake hose to assure fish are not pinned upon the screen. Screening techniques must be in compliance with Washington State Laws RCW 77.16.220, RCW 77.55.040 and RCW 77.55.070.

- All fish will be removed from stream crossing structures within the isolated stream reach. Connecting rod snakes may be used to help move fish out of the structure. The connecting rod snake is made of wood sections approximately three feet in length. As the snake is wiggled slowly through the pipe, noise and turbulence will evacuate the fish without injury.

3. Fish Release: For the period between capture and release, all captured aquatic life will be immediately put into dark colored five gallon buckets filled with clean stream water. Fish removal personnel will provide: a healthy environment for the stressed fish; minimum holding periods; and low fish densities in holding buckets to avoid effects of overcrowding. Large fish will be kept separate from smaller prey-sized fish to avoid predation during containment. Water-to-water transfers will occur whenever possible and the use of sanctuary nets are encouraged. Frequent monitoring of bucket temperature and well-being of the specimens will be done to assure that all specimens will be released unharmed. Potential shade areas for fish holding periods and supplemental oxygen will be considered in designing fish handling operations. Captured aquatic life will be released immediately upstream of the isolated stream reach in a pool or area that provides cover and flow refuge. Each fish will be completely recovered prior to release. One person will be designated to transport specimens in a timely manner to the site selected for upstream release. All work area isolation, fish removal and fish release activity will be thoroughly documented. Specifically, any injuries or mortalities to ESA-listed or proposed species will be provided to National Marine Fisheries Service (NOAA Fisheries) or United States Fish and Wildlife Service (USFWS), depending on which agency has jurisdiction over that species.

APPENDIX II – In-water Construction Monitoring Report

Start Date: _____
End Date: _____

Waterway: _____ Okanogan County

Construction Activities:

_____
_____
_____
_____
_____

Number of fish observed: _____
Number of salmonid juveniles observed (what kind?):

_____
Number of salmonid adults observed (what kind?):

_____

What were fish observed doing prior to construction?_____
_____
_____

What did the fish do during and after construction?

_____
_____
_____

Number of fish stranded as a result of this activity: _____

How long were the fish stranded before they were captured and released to flowing water?

_____
_____
_____

Number of fish that were killed during this activity: _____

Send report to:
National Marine Fisheries Service, Washington State Habitat Branch, Attention Diane Driscoll, 510 Desmond Dr. SE, Suite 103, Lacey, WA 98503.